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Comparative Study between Surgical Excision Verses Aspiration and Injection of Sclerosant in Wrist Ganglion Cyst

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Abstract
Background: *The entity Ganglion cysts are best described as benign soft tissue tumors, which are most commonly encountered in the wrist, but they may occur in any joint**.** No conservative treatment is beneficial, intervention is must.*
Aim: *To compare and analyze different outcome between surgical excision and aspiration followed by sclerosant injection for the management of ganglion.*
Objectives*: To assess, firstly the rate of recurrence between two methods of management, Secondly the intra operative and post operative complications and thirdly the cost involved in performing the procedure.*
Methods: *From Feb 2017 to March 2018, 50 patients underwent surgical excision and 50 patients underwent aspiration and injection of sclerosant. Results were collected and statistical analysis was done to reach the final conclusion.*
Results: *Maximum prevalence was seen in the age group of 29-38 years and almost no cases seen below 10 years, there was female predominance, location was more on dorsal surface, majority of the patients presented within 3 months of occurrence and when size of the cyst was between 1-2 cm, mostly cysts were not fixed, 86% patients were normal after surgery but only 52% showed normal features in a/i of sclerosant and the recurrence rate was much higher in a/i of sclerosant group than surgery group.*
Conclusions: *The excision surgery as a treatment modality for wrist ganglion was found to be statistically and significantly better than aspiration and injection of sclerosant as a treatment modality for ganglion cyst related to the wrist. The various parameters included in this study also concluded that the rate of complications, Reoccurrence, overall cost, etc in the patients of surgical excision group, were relatively less and uncommon than the patients of aspiration and injection of sclerosant group.*
Key words: *ganglion, sclerosant therapy, surgical excision*

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I. Introduction

The entity Ganglion cysts are best described as benign soft tissue tumours, which are most commonly encountered in the wrist, but they may occur in any joint. They may affect any age group; however they are more commonly encounterd in the twenties to forties. A history of trauma may be elicited in at least 10% of cases and can be considered as a causative factor although the pathogenesis still remains unclear. Incidence in males is 25/100,000 and in females 43/100,000. Prevalence is 19% in patients reporting wrist pain and 51% in the asymptomatic population [(1)]. Sixty to seventy percent of ganglion cysts related to the wrist are found in dorsal aspect of wrist & almost always have a communication with the joint via a pedicle. This pedicle basically originates not only at the scapholunate ligament [(2)], but also may arise from a number of other sites over the dorsal aspect of wrist capsule. Thirteen to twenty percent of wrist ganglia are found on volar aspect of wrist, arising via a pedicle which may originate from, radio scaphoid- scapholunate interval, scaphotrapezial joint, or metacarpotrapezial joint, order of frequency, as per this [(3)] .Ganglia may also arise from a flexor tendon sheath in the hand which may account for approximately 10% of the total cases. They may also occur in other joints, as well as intraosseus or intratendinous ganglia but are less common [(4)].

On Microscopic examination, the pedicle contains a tortuous lumen, connecting the cyst to the underlying joint [(5)]. The presence of this connection is supported by the arthrographic and intraoperative findings of Angelides and by Andren & Eiken who demonstrated the movement of intra-articular contrast agent from the radiocarpal joint into ganglia in appoximately 44% of patients examined with a dorsal wrist ganglion and 85% of patients with volar wrist ganglion. As the contrast agent does not appear to travel from the cyst into the joint, a one-way valve mechanism has been postulated for the etiopathogenesis of ganglion cyst [(6, 7)]. Such a one-way valves are thought to be formed by a number of small ‘‘micro-cysts’’ present in the tissue surrounding the

pedicle. These ‘‘micro-cysts’’ may communicate with the primary ganglion and when present are felt to be part of the tortuous pedicle lumen, which connects the cyst to the joint, and in the process creating a one-way valve mechanism [(8)]. Evaluation of ganglion cyst by electron microscopy demonstrates that the wall of the ganglion to be composed of several randomly oriented sheets of collagen arranged in loose layers, one on top of the other. There is no synovial lining which exists in these structures, thus they cannot be classified as true cysts. Though there may be focal areas of mutinous degeneration in the cyst wall, but neither a significant global degenerative changes necrosis nor inflammatory changes within this pseudocyst or surrounding tissues have been demonstrated on study [(9, 10)].

Origin of the ganglion itself remains as an enigmatic entity as the origin of its fluid. Various theories on cyst genesis which are postulated have been difficult to prove and most are unable to account for all of the existing features of the ganglion cyst. The concept that the ganglion cyst is a simple herniation of the joint capsule through areas of les resistance is difficult to support in light of the lack of synovial lining within the cyst (therefore called a pseudocyst). The theories which postulate that ganglion have an inflammatory aetiology have failed in relation to the pathologic studies showing no pericystic inflammatory changes.[(9, 11)] There are also many other theories, which have been postulated and may warrant consideration with the help of other studies in the future. In the first of all those, joint stress which can be , acute or chronic may lead to a formation of a rent in the joint capsule and which allows leakage of the synovial fluid into the peri-articular tissue. Further subsequent reactions between this fluid and local tissue around may result in the creation of the gelatinous cystic fluid and the formation of the ganglion cyst wall. In support of this ‘‘capsular rent theory”, some authors have also postulated that a pre-existing joint pathology (periscaphiod ligamentous injuries, etc.) is the underlying cause of rent or cyst formation. Joint abnormalities are also thought to lead to altered biomechanics within the cyst and, eventually weakening of the capsule, and finally leakage of fluid with its contents, and cyst formation. However, despite the arthroscopic findings which confirm the presence of an intra-articular joint pathology in 50% of ganglion patients examined, no correlation could be elicited between this pathology and postoperative cyst recurrence .This leads some investigators and authers to conclude that intra-articular pathology is not the only inciting event in the ‘‘rent’’ theory of ganglion formation. Alternatively, joint stress may also lead to mucinoid degeneration of the adjacent extra-articular connective tissue with subsequent fluid accumulation which leads to an eventual cyst formation. Lastly, some authors also believe that the joint stress may also stimulate mucin secretion by the mesenchymal cells of the microenviroment detected by electron microscopy in the surrounding tissues. All these literatures support that the final common pathway of all of these theories is the coalescence of all small pools of mucin which forms the main cyst. The production of the surrounding pseudo capsule is induced by an unknown mechanism, though may possibly occur from compression of surrounding tissues [(4, 12, 13)].

II. Material And Methods

A total of 100 patients divided into two groups each containing 50 patients each attending Madhav Dispensary OPD, JA Group of hospitals & G .R. Medical College during the period of Feb 2017 to March 2018.

After ethical approval from ethical committee this study was conducted on 100 patients divided in two groups each containing 50 patients each attending OPD Madhav dispensary, J A Group of hospitals and G.R. Medical College, Gwalior during study period. One group will undergo excision and the other group will undergo aspiration and injection of sclerosant.

Then the data will be collected by assessing the patients through preformed proforma and later all these data will be analysed by using online statistical analysis software.

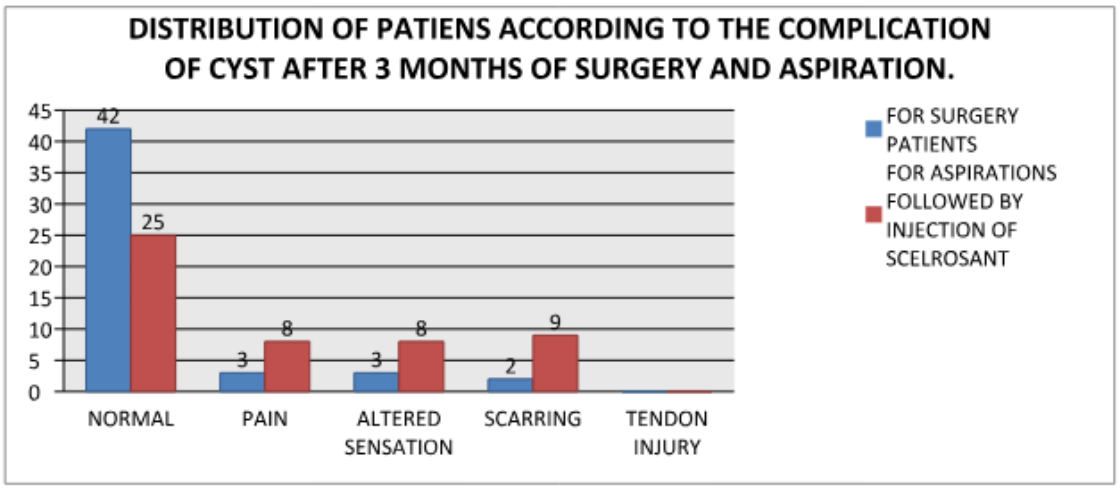
The patients were followed up after 15 days, 1 month, 3 months and 6 months. The follow up was done at surgery OPD, Madhav dispensary, G.R. Medical College. Follow up was essential to look for the late complications.

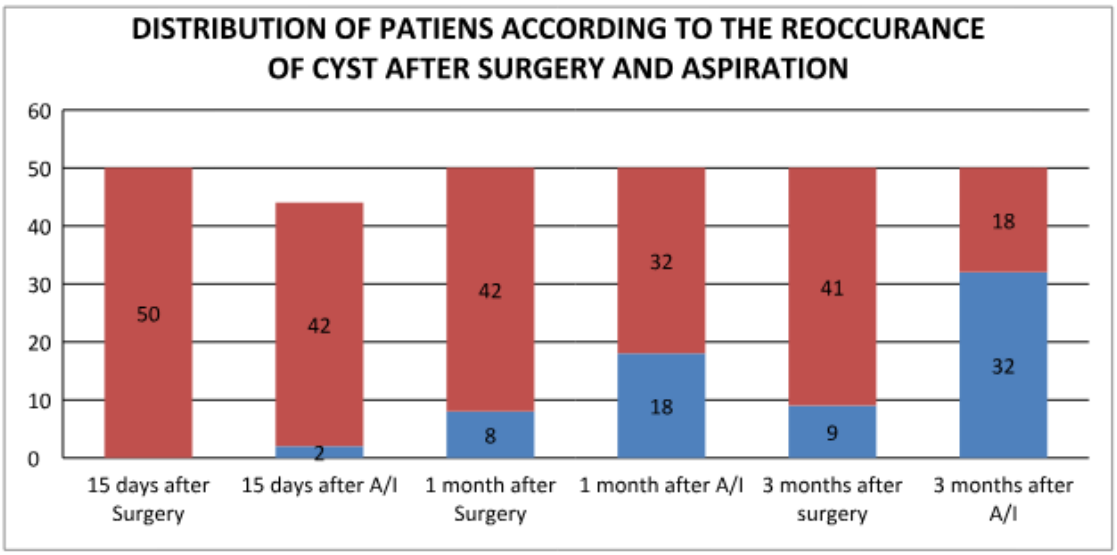
III. Observation And Results

It has a wide notion that ganglion of the wrist generally do not need any treatment and about 50% may regress on its own[1,2,14].But still it has to be managed in some cases where it becomes symptomatic .Various studies conducted by by angelides et-al and others concluded that although aspiration and injection of sclerosant seems to be a easy and cost effective procedure but still surgery has benefitted patients more in the follow up cases analysed.

Our study conducted in madhav dispensary OPD & JAH Gwalior in a total of 100 patients was also in accordance with these studies and have reflected that surgery seems to be a better option than A/I of sclerosant, this was also seen in regular follow up of patients. Further this study has also shown that with the development of better health care in hospitals the rate of complications due to surgery has decreased in this new era and results are far better as compared to A/I of sclerosant. Although reccurence as complication factor has been nearly the same as in previous studies.

To summarize our study as a whole it was seen that all our data and observation and results have been in accordance with the previous studies and no new or aberrant complication was found in our study, also no mortality was seen during a defined period of follow up in patients. Thus our study supports previous studies and work done by others in a positive sense.





IV. Discussion

Recently it has been seen that surgical excision of the wrist ganglion cyst remains to be the gold standard as a treatment of choice. This was contributed for the first time by angelides et-al, before which the post-op rates were very high (40%). The surgical techniques have been improved in the recent years in which the whole ganglion is removed as a complex, which includes the pedicle, cyst and the cuff near the joint capsule. This has also lead to low recurrence rates and complications[4]. The higher recurrence rates are generally due to incomplete dissection in which the duct pedicle system has not been removed as a whole. However not all literatures have supported this fact but still the variance in the level of care provided after surgery and the level of expertise of the surgeon if considered than under standard conditions the results are far better [3].Also it has to be kept in mind that the location of ganglia also has an effect on recurrence and complications, eg volar location is associated with more complications, reaching as high as 20%[15,16]. Govaers in his study has identified the inexperience of the surgeon as a risk factor for recurrence, and concluded that there are higher chances of recurrence in volar wrist ganglia. The cost associated with surgery is generally higher than any other technique. [8, 15,16,17,21]. Complications though are less but have been reported in many studies, Rizzo in his study has reported joint stiffness in follow up patients. Wright also reported complication (joint mobility), scaphoid – lunate joint instability, but may be present as a earlier feature. Also the damage to median nerve its branches and radial artery in case of volar ganglion should not be excluded. [4, 15, 16]. The study conducted by Wright et-al reported the recurrence rate to be only 29%. The studies conducted by westbrook found cosmetic complications to be the major factor.

Further in many setting still the main treatment modality for wrist ganglion is aspiration alone or aspiration and injection of sclerosant. Zubowicz in his studies showed a success rate of 85% but they were generally after 3 consecutive aspirations. However many studies have reported no gain in aspiration alone [19,20.]. It is to be noted that the location of ganglion (volar) may harm the adjacent structures eg median nerve and radial artery. [18,20] To decrease these side effects USG guided aspiration of ganglion cyst has also been in equipped centers. Paul and sochart have also used agents after aspiration and has given good results in their study. Mcevrdy in his study reported a success rate of nearly 82% after sclerosant injection. But in the recent years this study has not been validated [5,6]. Mackie in his study showed that the recurrence rate can be as high as 93 %. They also indicated other complications. Many studies have shown that which seems to be a good option for treatment (aspiration followed by injection of sclerosant) fails to be true if patients are followed up for a defined period and recurrence is commonly present. [15,16,19] Clearly above all these the follow up of patients and the expertise of the operating surgeon, has major effects on the data.

In our study- **COMPARATIVE STUDY BETWEEN SURGICAL EXCISION VERSUS ASPIRATION AND INJECTION OF SCLEROSANT IN WRIST GANGLION CYST, at** G.R. MEDICAL COLLEGE & J.A. GROUP OF HOSPITALS , GWALIOR was carried out and showed that –

Surgery although less preferred by patients especially women, was a better option, in the long run and if various other complications were kept in mind. At the end of 3 months after thorough analysis and follow up of patients, nearly 84 % patients were benefitted if mere complications were excluded, and the recurrence rates were around 18%. Cost the last of the factors included in our study was also a deciding factor in patient's preference for the specific treatment modality.

Aspiration followed by injection of sclerosant, which was more preferred as treatment option in our study and in our hospital setup showed that, although a relatively easy and quick technique, but in follow up cases were encountered with more complications and in some cases the pre and post -op clinical picture remains to be the same. May patients were never satisfied in follow up and asked for surgery. The cost being low at our hospital setting was a major factor for patients in choosing this as a treatment modality.

All data was analyzed by using chi-square test and results and discussion of our study is based on the analysis of these results. There are many studies worth mentioning that have been done on wrist ganglion whose cumulative results when seen in a bigger frame show that though aspiration followed by injection of sclerosant seems to be an easy patient friendly treatment modality, but still surgery provides a long term relief and less worrisome post op features.

Thus our study was aimed at finding a treatment modality of ganglion cyst which is both adequate, has fewer complications, has less recurrence and is cost effective. Our study correlates with the previous results and its effects analyzed in different studies.

V. Conclusion

Our study which was conducted in patients attending OPD Madhav dispensary, J A Group of Hospitals, Gwalior, concluded that surgery as a treatment modality for wrist ganglion was found to be statistically and significantly better than aspiration and injection of sclerosant as a treatment modality for ganglion cyst related to the wrist. The various parameters included in this study also concluded that the rate of complications in the patients who were included in the surgical excision group, were relatively less and uncommon than the patients included in aspiration and injection of sclerosant. This conclusion was made on the basis of follow up in patients for the analysis of different complications. Reoccurrence was analyzed as a completely different parameter, showed that its rate was much less common in surgical excision as compared to aspiration and injection of sclerosant.

This study also showed that the cost related to surgical excision versus aspiration and injection of sclerosant, in our hospital setup

Also patient's attitude and perceptions need to be changed as more patients coming in OPD of our hospital gave consent for aspiration and injection of sclerosant, most of which were females but later experienced complications and reoccurrence of the ganglion cyst. Thus this study concluded that surgery as a treatment modality of ganglion cyst, till now remains the most effective option for ganglion cyst, as compared to aspiration and injection of sclerosant.

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